PART I - ADMINISTRATIVE

Section 1. General administrative information

Title of project

Construct Sediment Settling Basins

BPA project number: 20153
Contract renewal date (mm/yyyy): ☐ **Multiple actions?**

Business name of agency, institution or organization requesting funding
Roza-Sunnyside Board of Joint Control

Business acronym (if appropriate) RSBOJC

Proposal contact person or principal investigator:

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NPPC Program Measure Number(s) which this project addresses
Section 7.6

FWS/NMFS Biological Opinion Number(s) which this project addresses

Other planning document references

Short description
Improve the quality of water discharged into the Yakima River from major drainage channels within the RSBOJC service area by construction of sediment settling basins.

Target species
Chinook, Coho, Sockeye, Steelhead, Bull Trout, Cutthroat, Brown Trout, Brook Trout

Section 2. Sorting and evaluation

Subbasin
Lower Yakima River

Evaluation Process Sort

CBFWA caucus	Special evaluation process	ISRP project type
Mark one or more caucus	If your project fits either of these processes, mark one or both	Mark one or more categories

☒ Anadromous fish ☐ Resident fish ☐ Wildlife	☐ Multi-year (milestone-based evaluation) ☒ Watershed project evaluation	☐ Watershed councils/model watersheds ☐ Information dissemination ☐ Operation & maintenance ☐ New construction ☐ Research & monitoring ☒ Implementation & management ☐ Wildlife habitat acquisitions

Section 3. Relationships to other Bonneville projects

Umbrella / sub-proposal relationships. List umbrella project first.

Project #	Project title/description
20526	Multi-Year Plan Yakima Anadromous Fish Plan

Other dependent or critically-related projects

Project #	Project title/description	Nature of relationship
	Improve Water-Quality Monitoring Program	The program will monitor the results of the sedimentation basin program

Section 4. Objectives, tasks and schedules

Past accomplishments

Year	Accomplishment	Met biological objectives?

Objectives and tasks

Obj 1,2,3	Objective	Task a,b,c	Task
1	Conduct a study	a	Conduct a study to identify potential basins in all the major drainages in the RSBOJC area of jurisdiction
2	Design Settling Basins	a	Select an engineering contractor
3	Acquire Property	a	Enter into a lease agreement or purchase property for basins.
4	Construct Two or Three Settling Basins	a	Select construction contractor
		b	Manage construction
5	Operation and Maintainence	a	Continue O & M into the future
6	Document water-quality results and	a	Show the cost of basin per sediment saved

	compare to cost of basin		ratio

Objective schedules and costs

Obj #	Start date mm/yyyy	End date mm/yyyy	Measureable biological objective(s)	Milestone	FY2000 Cost %
1	6/1999	8/1999			2.00%
2	8/1999	10/1999			7.00%
3	9/1999	11/1999			13.00%
4	11/1999	4/2000			76.00%
5	4/2000				1.00%
65	4/2000	10/2000			1.00%
				Total	100.00%

Schedule constraints
Land acquisition and permits may affect implementation schedule.

Completion date
2000

Section 5. Budget

FY99 project budget (BPA obligated):

FY2000 budget by line item

Item	Note	% of total	FY2000
Personnel	RSBOJC Staff	%2	5,000
Fringe benefits		%1	2,500
Supplies, materials, non-expendable property		%0	
Operations & maintenance		%0	
Capital acquisitions or improvements (e.g. land, buildings, major equip.)	Land Acquisition	%13	35,000
NEPA costs		%0	
Construction-related support		%0	
PIT tags	# of tags:	%0	
Travel		%0	
Indirect costs	office overhead	%1	1,500
Subcontractor	design and construction of basins	%83	220,500
Other		%0	
		TOTAL BPA FY2000 BUDGET REQUEST	$264,500

Cost sharing

Organization	Item or service provided	% total project cost (incl. BPA)	Amount ($)
		%0	
		%0	

		%0	
		%0	
		Total project cost (including BPA portion)	$264,500

Outyear costs

	FY2001	FY02	FY03	FY04
Total budget				

Section 6. References

Watershed?	Reference
☒	CH2M HILL, 1975. Agricultural Return Flow Management in the State of Washington. Prepared for Washington State Department of Ecology.
☒	Department of Ecology, 1990. Statewide Water Quality Assessment 350 (B) Report, State of Washington.
☒	USGS, 1976. Sediment Transport by Irrigation Return Flows in the Lower Yakima River Basin, WAshington. Open File Report 78-946.
☒	Joy, J. and Patterson, B. 1997 A suspended sediment and DDT total maximum daily load evaluation reprot for the Yakima River: Washington State Department of Ecology, Environmental Investigatons and Laboratory Services Program, Watershed Assessment Section,
☒	Rinella, J.F., McKenzie, S.W., Fuhrer, G.J., 1992, Surface-water-quality assessment of the Yakima River Basin, Washington, analysis of available water-quality data through 1985 water year: Geological Survey, Open-File Report 91-453, 244p.
☒	Ecology, 1986, Priority waterbody assessment of the lower Yakima River, Washington State Department of Ecology, Olympia, Washington.

PART II - NARRATIVE

Section 7. Abstract

The RSBOJC is proposing a plan to increase salmon and steelhead populations by improving water-quality. The water quality will be improved by reducing sedimentation, temperature and other important factors. These water quality improvements will be accomplished by the incorporation of sedimentation basins to capture sediment before it can discharge to the lower Yakima River.

Installation of the settling basins will be achieved through a six-step program, which will consist of study, design, property acquisition, construction, O & M, and documentation.

Section 8. Project description

a. Technical and/or scientific background

The lower Yakima River basin has been identified as one of the most intensively irrigated and agriculturally diverse regions in the United States. More than 325,000 acres of cropland is being irrigated in the Yakima Valley and a vast network of drains exist to convey excess water, in the form of irrigation- and agricultural-return flows, to the Yakima River. These return flows can account for as much as 80 percent of the lower Yakima River main-stem flow during the irrigation season. Return flows are seriously polluted and, as a result, the lower Yakima River exceeds permissible state standards for DDT,

Ammoniea and other nutrients, temperature and turbidity. Because of these conditions, the Yakima River has been listed as impaired under the Federal Clean Water Act. Once abundant salmon and steelhead populations have dwindled to precariously low levels and other beneficial uses of the Yakima River water are in jeopardy. Consequently, the quality of the water in the lower Yakima River is highly dependent upon the quality of these agricultural-return flows(Joy and Patterson, 1997).

Wastes from some agricultural practices, irrigation-return drains, municipal and industrial treatment plant effluents, run-off from poorly managed forest and range practices, and urban runoff have been identified as pollutant sources, according to Ecology's Suspended Sediment and DDT Total Maximum Daily Load Evaluation Report for the Yakima River (Joy and Patterson, 1997). Intensive agriculture (return flows and grazing) has caused widespread habitat degradation. Resource problems include low flow at diversions, water quality degradation and pesticide. Low flows, high temperatures and sedimentation reduce fall Chinook spawning success.

The movement of suspended sediment in streams is an important factor in the transport and fate of chemicals in the environment. Many water-quality constituents including trace metals, organic compounds, indicator bacteria, and nutrients are associated with suspended sediment. Large suspended-sediment concentrations and associated contaminants can potentially affect water used for domestic-water supplies, aquatic-life propagation, and recreation (Rinella *et al.*, 1992). Sediment, predators and lack of side-channel refuges limit juvenile rearing and over-wintering survival. Sediment also limits egg-to- fry emergence survival for all species of salmonid in virtually all reaches of the Yakima Basin.

Water quality studies performed in the mid-1970's through the mid-1990's by Ecology, the U.S. Geological Survey, Washington State University, Conservation Districts, the United States Bureau of Reclamation (USBR), and others focused on irrigated agricultural areas in the lower Yakima River basin. Results from these studies indicated that suspended-sediment concentrations and turbidity in agricultural-return drains, and in the lower Yakima River, were directly affected by irrigation practices (Joy and Patterson, 1997). In fact, irrigation return flow has been identified as the single most significant source of pollutants to the lower Yakima River (Ecology, 1986).

The RSBOJC proposes that sedimentation basins constructed in major drainages will improve the water-quality returning to the lower Yakima River. Preliminary results on one small settling basin shows approximately $15/tons of silt saved. Using this figure this project would save approximately 10,000 tons of silt from going into the lower Yakima River. The location of the most favorable sites needs to be determined by conducting a study. Once the sites have been determined, the land will have to be acquired. An engineering firm will be hired to do the engineering and construction phase.

b. Rationale and significance to Regional Programs

The concept of sedimentation basins fits into the goals and objectives of Section 7.6 of the Fish and Wildlife Program. This would be a possible action taken to rehabilitate the watershed in the interest of restoring salmon and steelhead stocks.

c. Relationships to other projects

The RSBOJC's water quality-monitoring will be collecting and analyzing the results of the settling basins.

d. Project history (for ongoing projects)

N/A

e. Proposal objectives

OBJECTIVE 1: Conduct a Study
Conduct a study to identify potential basins in the major drainages in the RSBOJC area of jurisdiction.

OBJECTIVE 2: Design two to three prototype basins
An engineering consultant will be hired to design the settling basins.

OBJECTIVE 3: Acquire Property
RSBOJC will enter into a lease agreement or purchase land for basins.

OBJECTIVE 4: Construct Basins
A construction contractor will be hired for the construction phase of this project. The construction activities that will be required are the same as currently practices by qualified local construction contractors. The work that will be needed to construct the sediment settling basins can be completed during the irrigation season. This will allow the work to proceed during favorable weather conditions and thereby reduce costs.

OBJECTIVE 5: Operation and Maintenance
The operation and maintenance will be an on-going operation for RSBOJC. This will be funded by assessments in the following years.

OBJECTIVE 6: Documentation
The water quality results will be monitor and compare to baseline data collected. These results will be compared to the cost to construct the basins and a cost ratio will be determined. This information will then be shared with other organizations.

f. Methods

Installation of the settling basins will be achieved through a six-step process, which will consist of study, design, acquisition, construction, operation and maintenance, and documentation.

The study will be based on:
1. Can the land be readily purchased or leased

2. Location to the Yakima River in order to achieve improved water-quality

3. Soil type/stability

4. Easily accessible

5. Location to good fill material if needed

Once the study has been completed two or three sites will be selected for design and construction. The planning work needed to implement the sediment settling basin program is similar to the type of work regularly performed by the RSBOJC staff. The design and construction management is beyond the RSBOJC's ability to staff for this short duration project. It is anticipated that a consultant will be used for these tasks. Likewise, a construction contractor will be used for the actual construction work. The administrative workload will be able to be handled with the existing RSBOJC staff.

There will be a need for continuing inspection and maintenance of settling basins. The RSBOJC is prepared to assume these responsibilities after the first year of operation. No continuing O & M budget is projected as part of the publicly funded project after the first year of operation (end of 2000).

g. Facilities and equipment

The planning work needed to implement the sediment settling basin program is similar to the type of work regularly performed by the RSBOJC staff. It is not anticipated that it will be necessary to acquire any additional specialized equipment or facilities for the planning work.

h. Budget

The personnel plus fringe benefits will cost $7,500. Land acquisition will be budgeted at $35,000. Office overhead will be $1,500. The design and construction of the basin done by a contractor will cost $220,500. The total budget will be $264,500.

Section 9. Key personnel

The RSBOJC is prepared to do the planning phase and oversee construction. A qualified engineering consultant will be hired for the design phase and a qualified construction contractor will be hired for the construction phase. The RSBOJC staff will accomplish on-going operation and maintenance.

Section 10. Information/technology transfer

The project is expected to serve as a demonstration of the benefits that can be achieved by managing the quality of water that returns to irrigation and drainage waterways by using managed sedimentation basins. This concept could be applied to many other irrigation and drainage projects and become an agency standard.

Congratulations!